

# Grants.gov Storefront IV&V: PureEdge on Mac



Contract 30106EASAM  
File "PureEdge on Mac v1.1.doc"  
November 3, 2004  
Prepared by



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## **Executive Summary**

PureEdge viewer works on an Apple Macintosh computer when used in conjunction with a software emulator. The Independent Verification & Validation (IV&V) team of Grants.gov tested its operation under three different operating systems (Windows 95, 98 and 2000 Professional) running under emulation mode on a Mac iBook computer. In all cases it was possible to download a grant application, complete it offline, print it locally and submit it for processing to Grants.gov. While the performance was slow due to the emulated environment, the user experience was similar to a Windows machine. IV&V did not discover any major issues that might prevent use of Macintosh platform for interacting with Grants.gov.

This document summarizes lessons learned during testing. It also provides basic guidance on selection of emulation software, and detailed installation and configuration of PureEdge on Mac.

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## Preface

### Purpose and Scope

This document provides information about using PureEdge in an emulated environment on Mac. It includes answers to basic questions about using Mac computers with Grants.Gov and describes detailed installation and configuration of an emulated environment.

### Background

PureEdge viewer is required to open, complete and submit a grant application obtained from Grants.gov but it works only on Windows operating systems. Microsoft Virtual PC (VPC) v6.1 is a PC emulation software that allows Mac users to run Windows applications. Once VPC is installed on a Mac, a guest<sup>1</sup> operating system such as Windows 2000 or Windows XP can be installed *inside* the emulated environment provided by VPC.

This document is based on the results of testing several guest operating systems including Windows 95<sup>2</sup>, Windows 98 and Windows 2000 Professional on a Virtual PC for Mac 6.1 on an Apple iBook running OS X 10.3.2.

### Audience

This document is geared toward both customer support staff of Grants.gov and (experienced) Mac users in the Grantee community.

### Organization of this document

The first section provides a discussion of some common Mac issues in a Frequently Asked Questions (FAQ) format. It is followed by detailed installation and configuration information for Virtual PC for Mac.

### Revision History

Version	Date	Description of Change
0.1	12/26/2003	Initial draft.
0.2	1/14/2004	Added section on printing.
0.3	1/16/04	Reformatted for readability.
1.0	1/20/2004	Added references.
1.1	2/5/2005	Added Citrix option

### Approvals

Name	Signature	Date
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<sup>1</sup> The host platform is the machine that runs the Virtual PC for Mac software. The guest platform is the operating system and applications that Virtual PC is simulating.

<sup>2</sup> Please note that PureEdge is not officially supported on Windows 95 and Microsoft no longer provides support for this operating system. On a related note, Microsoft recently extended support for Windows 98 to June 2006.

Internal Use Only

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# **1 General FAQ for using a Mac with Grants.gov**

## **Q. What browsers on Mac are compatible with Grants.gov?**

While Grants.gov has not been thoroughly tested on Mac, all newer versions of Safari, Netscape, IE and Mozilla should allow searching and downloading of grant applications from Grants.gov. However, to fill out a grant application and submit to Grants.gov for processing a PureEdge viewer is required.

## **Q. Is there a Macintosh version of the PureEdge viewer?**

A. No. The PureEdge viewer runs only on Windows. However, Mac users can use an emulation software to run PureEdge.

## **Q. What Windows emulation software is available for Macs?**

A. Microsoft Virtual PC for Mac is available in several flavors. Cost ranges between \$129-\$250 depending on if it comes bundled with a Windows operating system or not.

## **Q. What else do I need to run PureEdge on a Mac?**

A. Microsoft Virtual PC for Mac requires a G3 or a G4 Mac with at least 256 MB physical RAM, 2 GB free hard drive space running either Mac OS X 10.1.5 or higher or Mac OS 9.

## **Q. Is Virtual PC for Mac compatible with G5 processors?**

A. No, as of writing this document (1/2004). Check for latest status on <http://microsoft.com/mac>. According to latest product announcements from Microsoft, v7.0 due in 1<sup>st</sup> half of 2004 will support G5. Please see the end of this FAQ for an alternative.

## **Q. Is there a separate version of PureEdge viewer that works with Microsoft Virtual PC for Mac?**

A. No, there is only one version of PureEdge, which can be downloaded from <http://www.grants.gov/DownloadViewer>.


## **Q. What can be done using PureEdge running on Microsoft Virtual PC for Mac?**

A. You can download, complete, submit and print grant applications using PureEdge on Mac.

## **Q. Is USB printing supported under Virtual PC?**

A. Yes, according to product documentation, but your mileage may vary (During tests with two different printers - Samsung Laser ML 1450 and HP Officejet 4100 multifunction - USB printing did not work). An alternative option is to install a PDF print driver (such as [Adobe Acrobat](#) or [PDFCreator](#)) under emulated environment and 'print' to a PDF file. This eliminates the need to install additional printer drivers. PDFCreator is an open source software [available here](#).

## **Q. Can I access Mac folders from within a Virtual PC for Mac session?**

A. Yes. Click on Window->Virtual PC List from the Virtual PC application menu bar (or alternatively press <sup>3</sup> and L together) to bring up list of virtual PCs. Select the desired virtual PC and click on settings. Click on Shared Folders and make sure Local Volumes is checked in the right hand column.

### **Q. What if there is more than one Mac user in an organization?**

1) Install Virtual PC for Mac on all Macs. 2) Install the guest operating system (such as Windows 2000 or XP) on any one machine 3) Copy the .VPC6 file from the “Virtual PC List” folder to all the Macs (by default the complete path to a Windows 2000 file, assuming username of joe will be /Users/joe/Documents/Virtual PC List/Windows 2000.vpc6)

### **Q. What if there are more than more than 5-10 Mac users?**

For large number of users, organizations may want to explore using a Server based solution to allow any number of Mac users to run PureEdge. This has the advantage that end-users don't have to install any software except a free utility called [Remote Desktop Connection](http://www.microsoft.com/mac/otherproducts/otherproducts.aspx?pid=remotedesktopclient) (<http://www.microsoft.com/mac/otherproducts/otherproducts.aspx?pid=remotedesktopclient>) available from Microsoft. The downside is that a dedicated Server machine is required that runs either [Windows Terminal Server](#) or [Citrix](#).

### **Q. Are there any open source alternatives to Virtual PC for Mac?**

Yes. [Bochs](#) is an open source x86 emulator that works similar to Virtual PC. It's available in two different flavors - a free [text-based installer](#) and a paid [graphical installer](#) version called Wintel for Mac OS X. Bochs/Wintel is compatible with G5 but provides no USB support. Please note IV&V has not tested this configuration.

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<sup>3</sup> Also known as the Command or Apple key

## 2 Obtaining and installing Virtual PC

### 2.1 Selecting the right flavor

Microsoft sells Virtual PC for Mac in four flavors. Three of them come bundled with a Windows operating system. The fourth one is “bring your own OS” flavor. The tested version was the latter variety called Virtual PC for Mac - Standalone. The most significant difference is that with the standalone version, the user must provide a *bootable* installation CD of windows operating system of their choice. Otherwise they are identical.

It is important to understand that regardless of the flavor of the chosen software, a *complete Windows operating system must be installed on a Mac*. Virtual PC simply emulates an x86 environment on a Mac to install and run Windows.

#	Name	Operating System Included	Retail Price	Comments
1	Virtual PC for Mac v6.1 – Windows XP Professional	Yes	\$249	Recommended
2	Virtual PC for Mac v6.1 – Windows 2000 Professional	Yes	\$249	Recommended
3	Virtual PC for Mac v6.1 – Windows XP Home edition	Yes	\$219	Not suitable for windows based domain networking
4	Virtual PC for Mac v6.1 – Standalone	No; User must provide a Windows installation CD	\$129	Appropriate for users experienced with installing Windows

Table 1 – Different flavors of Virtual PC

For options 1-3, there is no additional software required.

### 2.2 Minimum system requirements

Virtual PC for Mac can be run on Mac OS X or Mac OS 9. For better performance a G4 machine with 512 MB RAM or more running OS X 10.2.3 is recommended. Free hard drive space should be at least 2 GB.

### 2.3 Where to buy

Virtual PC can be bought from retail stores such as Bestbuy or from online retailers such as [CDW](#), [Macmall](#), and [Maczone](#).



## **2.4 *Installing an operating system without a bootable installation CD (such as Windows 95 or Windows 98<sup>4</sup>)***

If no bootable CD is available for installing Windows 95 or Windows 98 then a DOS image is required<sup>5</sup>. Obtain a DOS boot image from one of the many free DOS projects on the Internet (<http://newdos.yginfo.net/msdos71/index.htm><sup>6</sup>, be sure to download the basic DOS image with CD support).

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<sup>4</sup> Also covers Windows 98 Second Edition (SE).

<sup>5</sup> Please note you must still have a Windows 95 or 98 installation CD.

<sup>6</sup> Offline at the time of writing.

## 3 Installing Virtual PC

### 3.1 Basic Installation

Installation of Virtual PC is straightforward following the instructions in the “Getting Started Guide” on the installation CD. It requires copying Virtual PC file from the CD to the /Applications folder and starting the installation process by double clicking on the Virtual PC 6 icon for Mac OS X.

The next step is to create a virtual PC. This is done by selecting File->New option from the Virtual PC menu which starts a wizard (Figure 1).

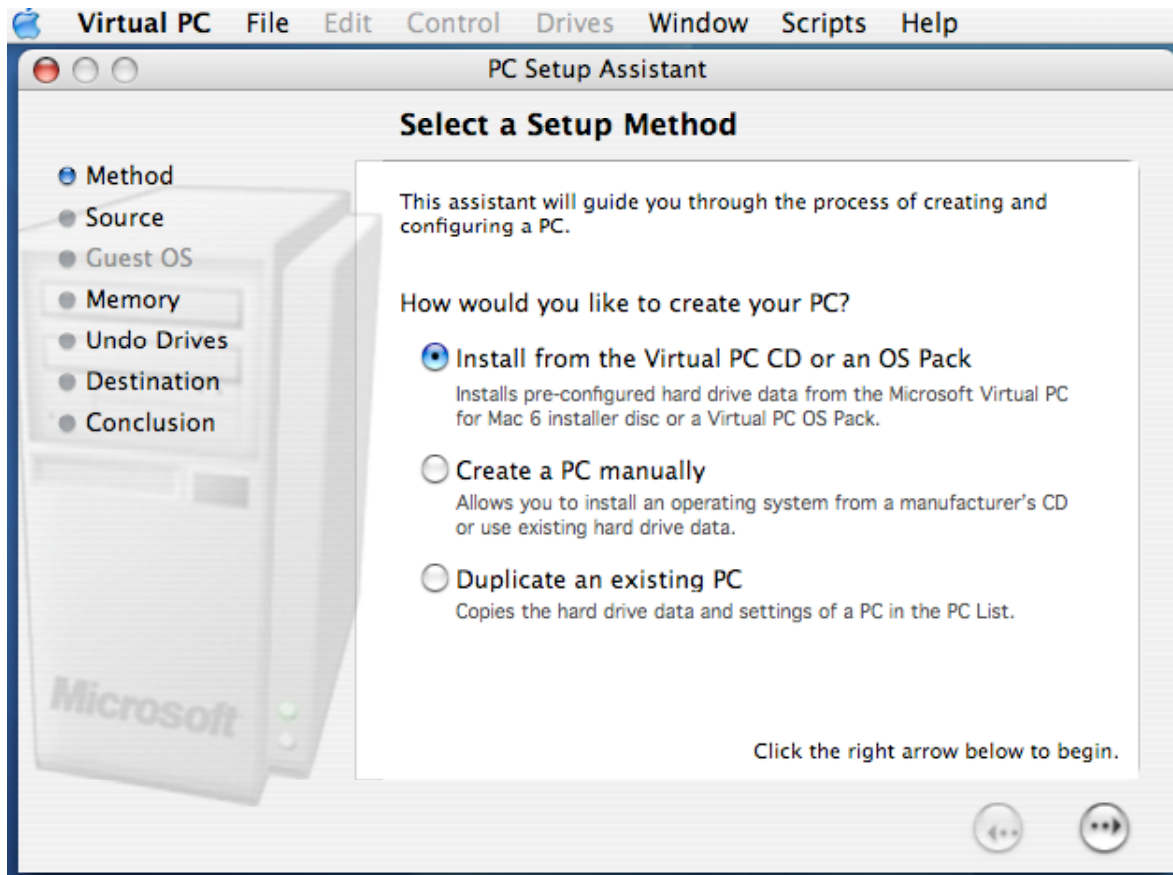


Figure 1- Creating a Virtual PC

If the installation disc came with a Windows OS pack, select the “Install from CD option.” It will automatically create a virtual PC and configure the included Windows operating system. Skip to the section entitled “Post-installation steps”.

### 3.2 Installing Windows with no bootable CD

Select “Create a PC manually” and answer the wizard’s questions. Make sure to allocate at least 256 MB RAM (or as much as you can) to the virtual PC. At the end of the process, the wizard will create a standard virtual PC 10 MB in size that will automatically grow based on usage. Once a virtual PC is created, a guest operating system needs to be installed. First download the

DOS image from <http://newdos.yginfo.net/dosware/msdos71b.zip>. Unzip it to a folder (By default, Safari will automatically unzip it to a folder on the Desktop, for other browsers use appropriate steps). Next, start up the virtual PC by clicking on the “Start Up” button as shown in Figure 2.

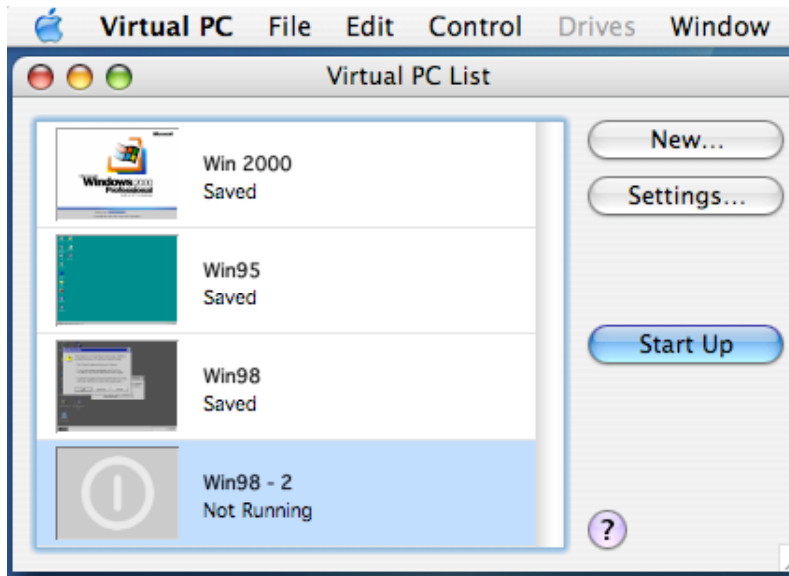


Figure 2- Starting up a Virtual PC

As shown in Figure 3, it will result in a system response of “OS not found” since no Operating System has been installed yet on the virtual PC.

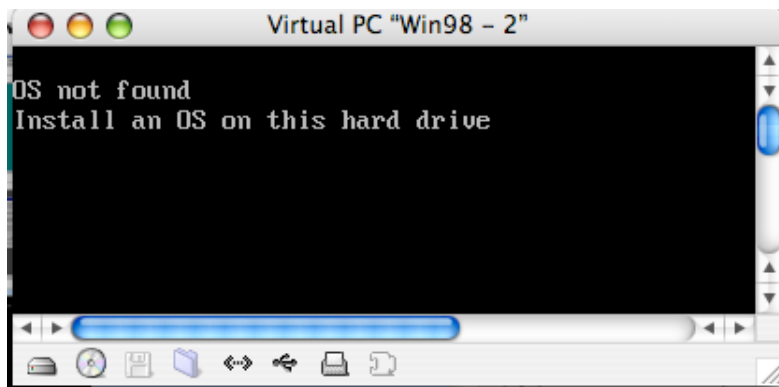


Figure 3

Click on Drives->Capture Floppy Image from the Virtual PC menu and navigate to the folder containing DOS image as shown in Figure 4. Select the DOS image (file ending with .img extension) and click open.

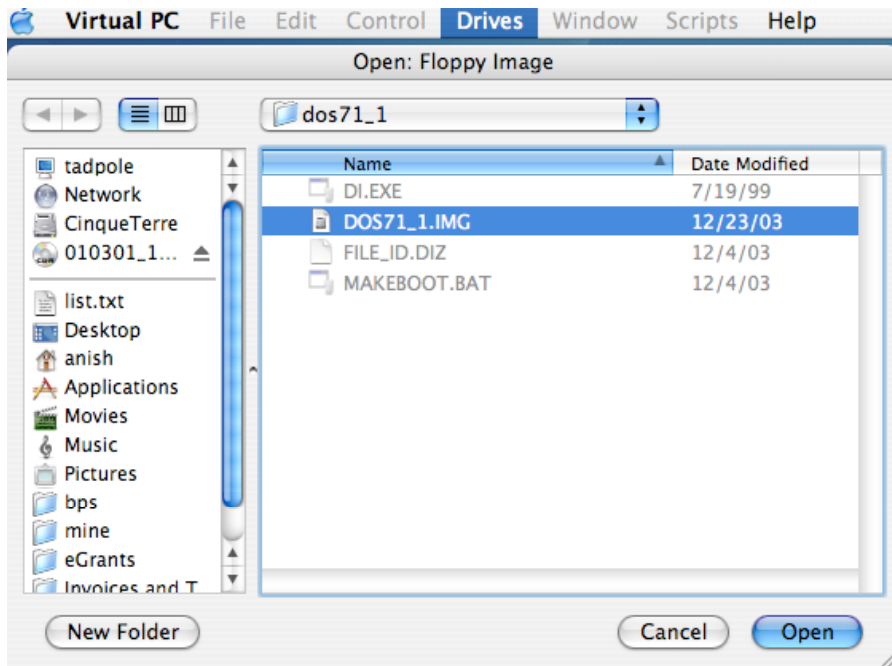


Figure 4 – Capturing DOS image

Now click on Control->Restart to reboot the Virtual PC session. This action is analogous to inserting a floppy disk in a physical PC and restarting it by using CTRL-ALT-DEL or the reset button. As shown in Figure 5, a DOS installation process is automatically started.

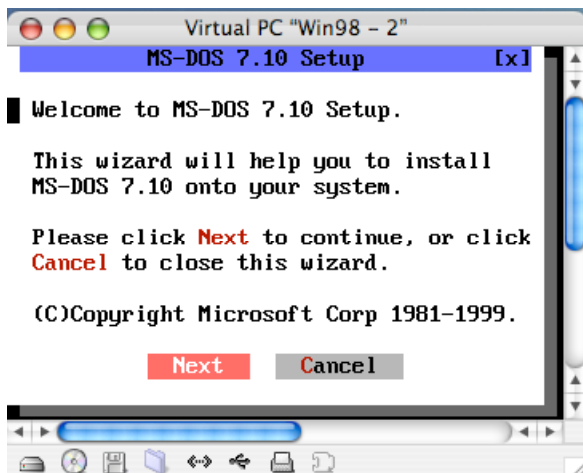


Figure 5 – Installing DOS

Follow the prompts and select the default option in most cases (except, don't select the 2-disk full installation option). This ensures that CDROM drive on the Mac becomes available to DOS sessions. Reboot the virtual PC session when prompted and you should see a "C:\ " prompt. Type D: at the prompt and it should respond with "D:\." Insert Windows 95 or Windows 98 installation CD and type "setup" at the prompt and follow instructions to install the operating system.

## 4 Post-installation steps

### 4.1 Optimizing Virtual PC settings

Start Virtual PC, select the virtual PC created in previous steps and click on Settings. As shown in Figure 1, there are several settings that control how a virtual PC session interacts with the host Mac. The following sections describe some key settings that must be configured after installing Windows.

#### 4.1.1 Memory

Microsoft recommends minimum memory requirements in “Getting Started Guide” on the product CD. They were accurate in that the minimum requirements were barely enough to provide a usable experience. During testing, Windows 95 and Windows 98 showed acceptable performance with 256 MB memory allocation, while Windows 2000 required 384 MB to extract acceptable performance. In all cases, running in full-screen mode produced better user experience than in a window mode.

#### 4.1.2 Networking

Networking must be configured for downloading grant applications with Grants.gov<sup>7</sup>. Click on Networking in the left pane of the main settings window. As shown in Figure 5 the *Shared Networking* option uses Mac’s TCP/IP connection and does not require any IP configuration in Windows. Enable Networking and make sure Shared Networking is checked.

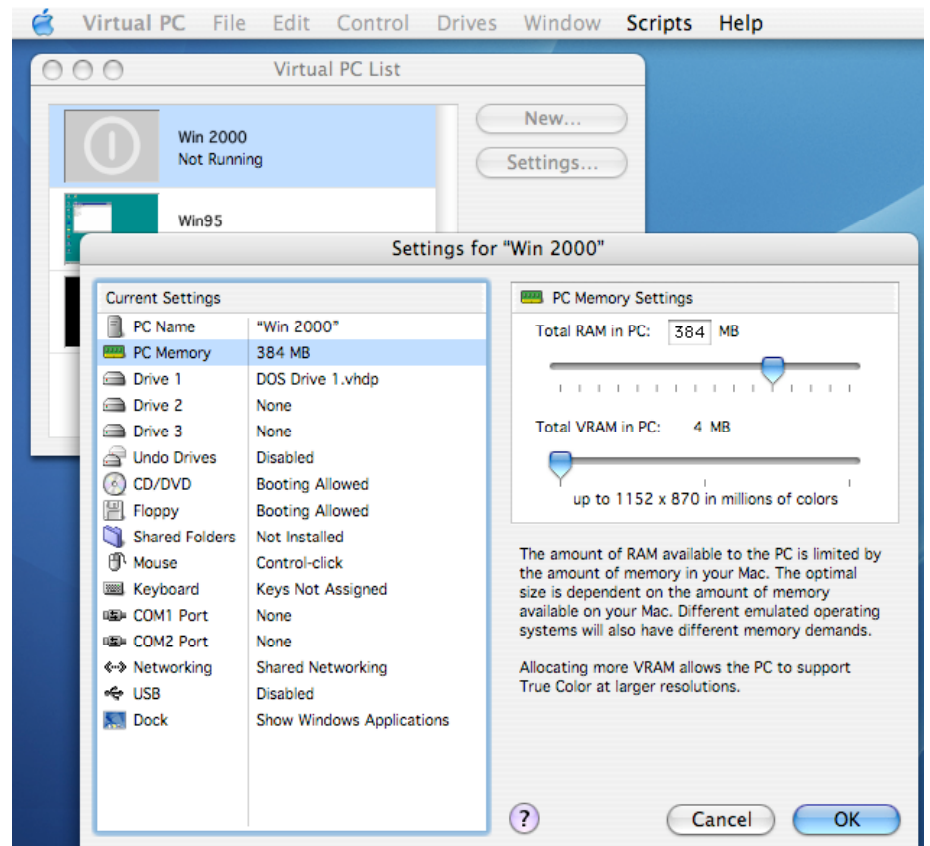


Figure 5 – Memory Settings

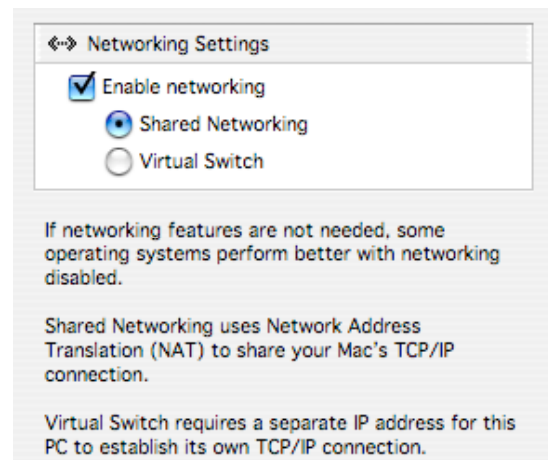


Figure 5

<sup>7</sup> As of this writing (1/12/04) Grants.gov has not been tested with Safari, Mozilla or Netscape browsers on Mac. However, Internet Explorer version 5.2.3 on Mac should be usable.

### 4.1.3 Printing

Setting up printing in the Windows environment requires several considerations. To setup a USB printer, 1) USB must be enabled in the settings as shown in Figure 3, and 2) appropriate drivers must be available for Windows. Click on USB Settings in the left pane of the Settings window. Enable USB and make sure your printer shows up in the list and is checked ((Make sure your printer is connected if it is not listed). It is also instructive to remember that while the Virtual PC session is running, the USB printer is *not* be available to other Virtual PC sessions or even the host Mac machine. Alternatively, a Network printer can also be configured. The steps required for configuring network printing for a virtual PC session

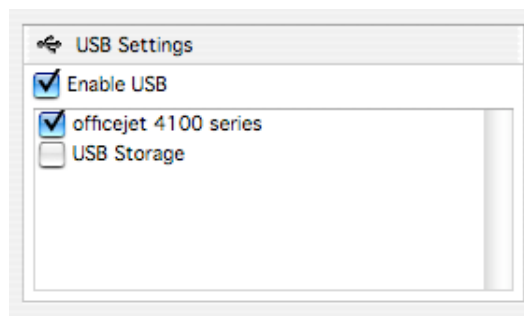


Figure 5 – Configuring USB

are identical to that of a physical PC and differ by type of print server used. Yet another approach to printing is installing a pdf printer driver. Once this driver is installed, any file can be converted into a pdf file for viewing or printing via native Mac tools. While there are several commercial pdf conversion tools available (including Adobe Acrobat), [PDFCreator](http://sourceforge.net/projects/pdfcreator/)<sup>8</sup> is open source and free. Download and save the software from within a windows session to the windows desktop or any other windows folder of choice. Double click on the file from windows explorer to install the software. Towards the end of the install process, select the option to create a desktop icon. Once installed, restart the machine and then double click on the PDFCreator icon on the desktop. Click on Printer->Options in the ensuing menu to review program settings (Figure 8). Save changes by creating a simple text file using built-in editor Wordpad (Start->Program Files->Accessories->Wordpad). Type some text and click on File-Print. Make sure PDFCreator is highlighted in the printer list and click OK. In the next dialog box, uncheck “After saving, open the document with the default program,” click Save. Type in name of file or accept the default. Be sure to save it on a Shared Folder to be able to access it from Mac OS X (or OS 9). Switch to OS X, locate the pdf file just created, double click on it to verify the contents.

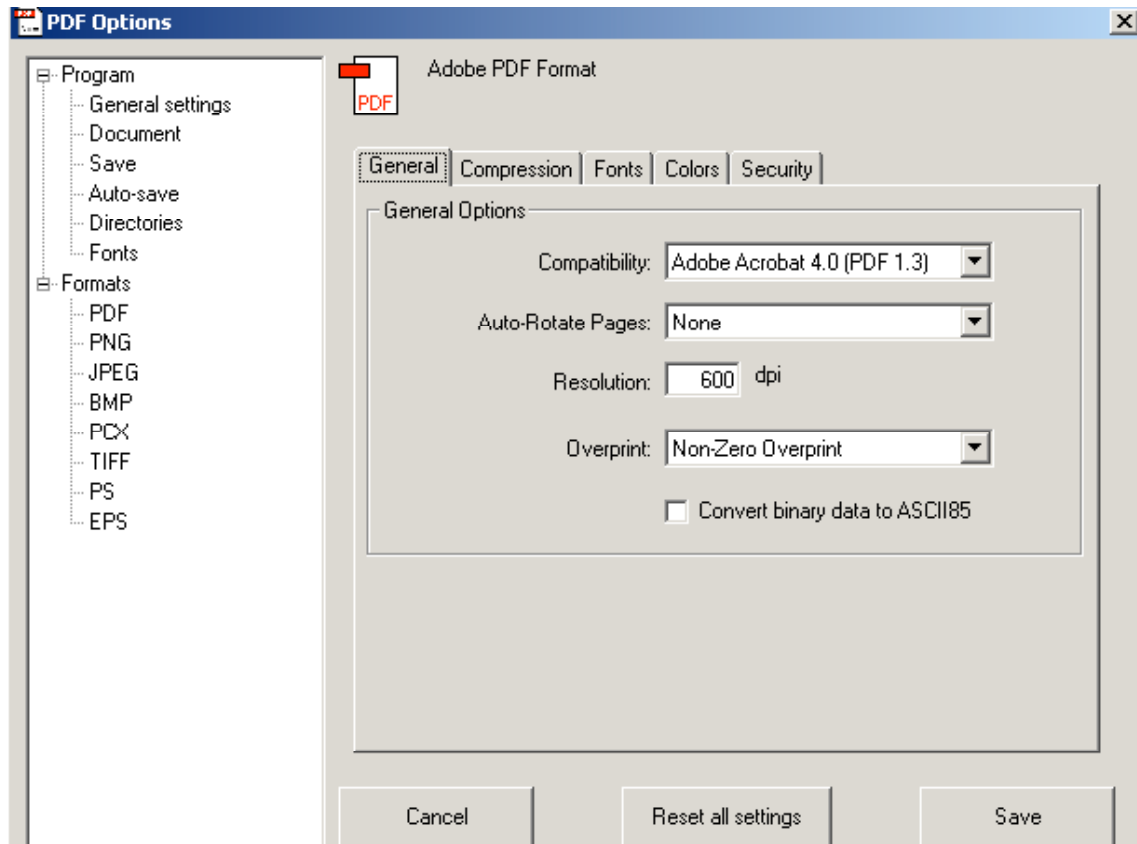


Figure 6 – Configuring PDFCreator

<sup>8</sup> <http://sourceforge.net/projects/pdfcreator/>

## 4.2 Updating Windows

Windows can be updated by running Internet Explorer and clicking on Tools->Windows Update. This updates Windows with the latest security patches, bug fixes and new versions of software including Internet Explorer. Please note that Microsoft no longer supports Windows 95. Figure 4 shows Windows 98 being updated using this process.

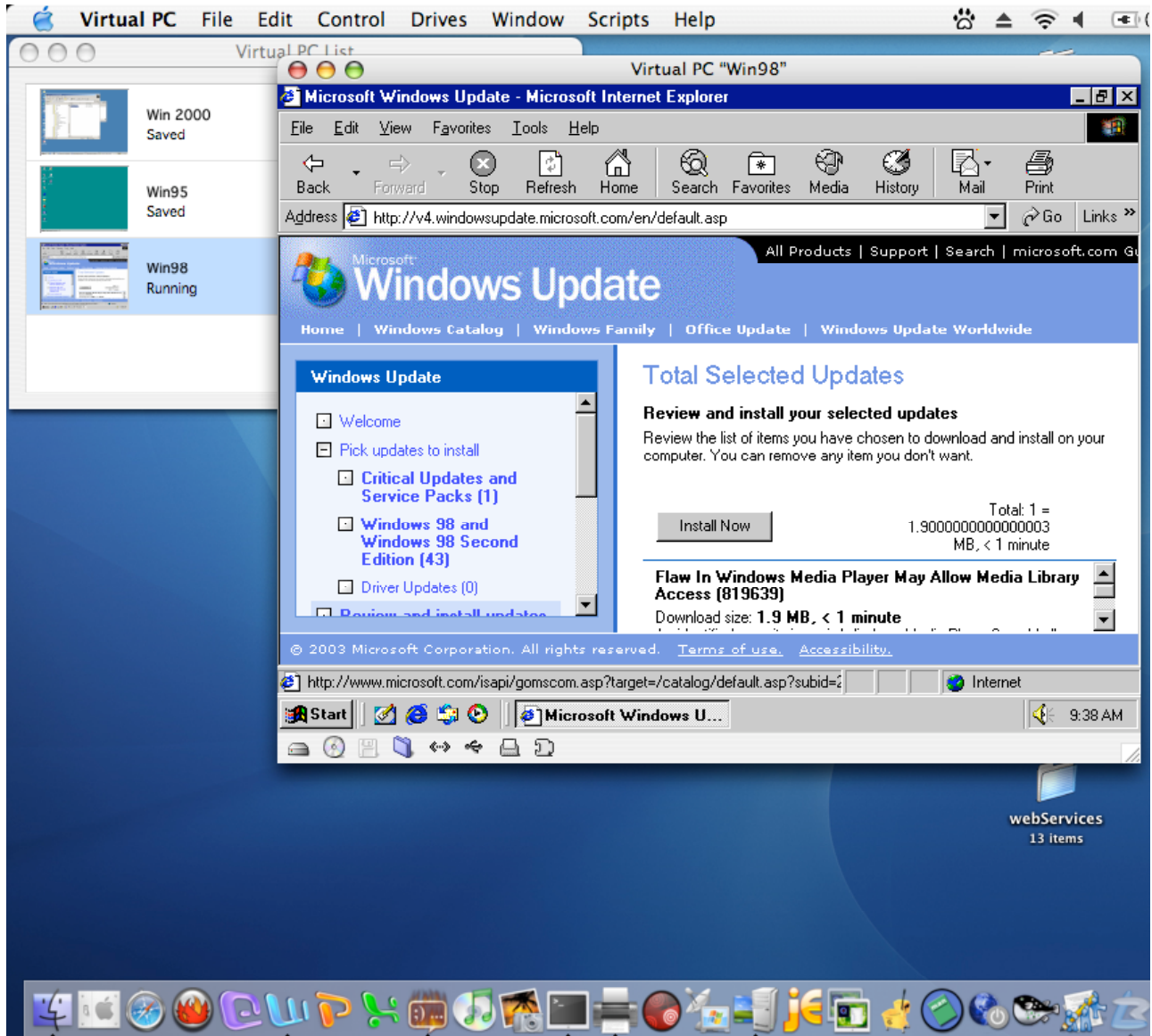


Figure 7 – Updating Windows 98 using Internet Explorer



## 5 Obtaining and installing PureEdge viewer

The latest version of the [PureEdge viewer](http://www.grants.gov/DownloadViewer) can be obtained from Grants.gov.<sup>9</sup> Save the downloaded file into a folder and double click on the file in windows explorer to install it.

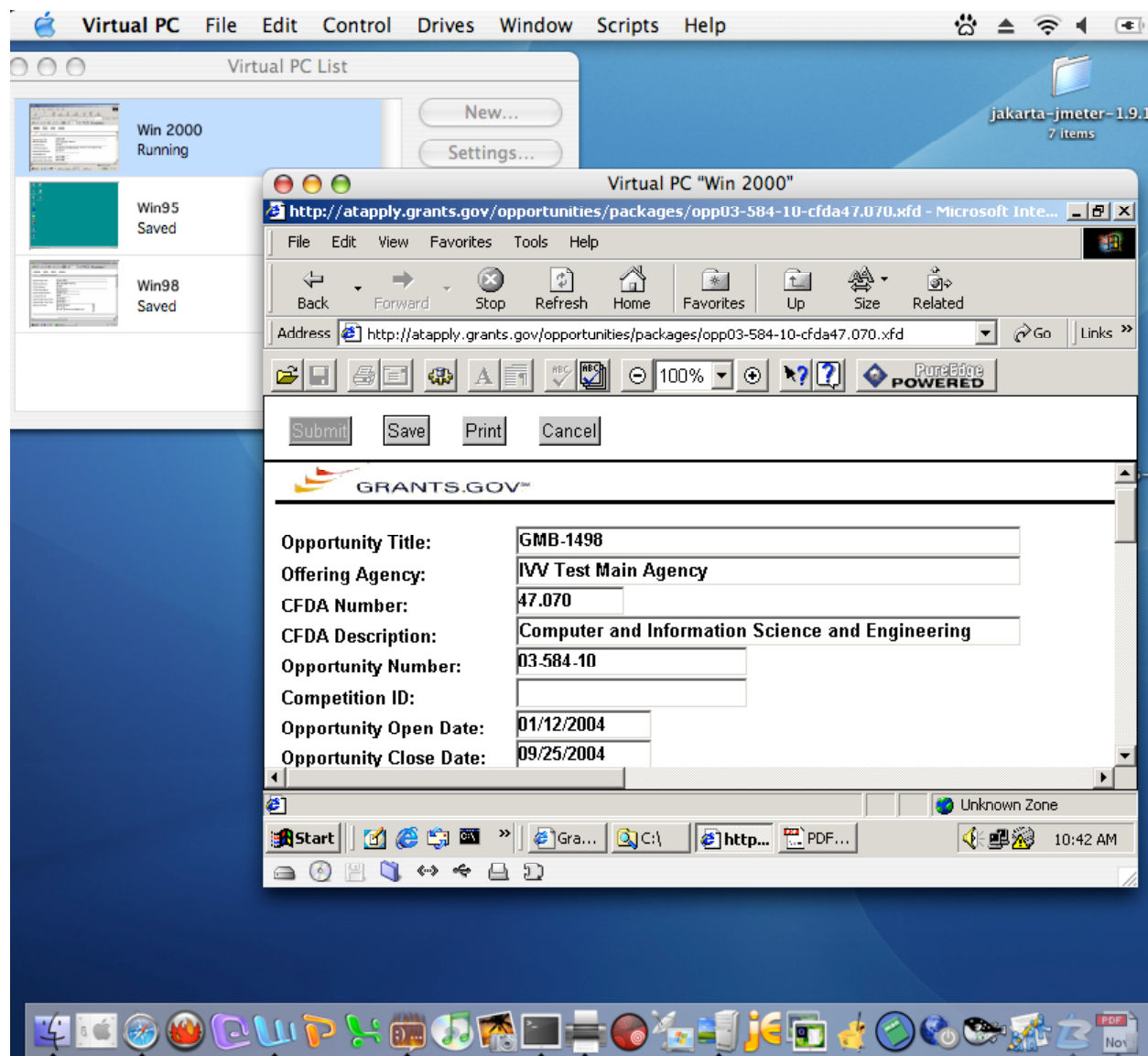


Figure 8 - PureEdge viewer running inside a Windows 2000 Virtual PC session

Once PureEdge viewer is installed, run Internet Explorer from within the Windows session and go to Grants.Gov to search or download an application. Figure 8 shows an active Internet Explorer session with a grant application open inside the PureEdge viewer plug-in. If you have any further questions, please call Grants.gov customer support at 800-518-Grants (4726).

<sup>9</sup> <http://www.grants.gov/DownloadViewer>

## Appendix A Additional resources

- [Microsoft support articles on Virtual PC for Mac](http://support.microsoft.com/search/default.aspx?InCC_hdn=True&Catalog=LCID%3D1033%26CDID%3DEN-US-KB%26PRODLISTSRC%3DON&Product=&KeywordType=ALL&Titles=false&numDays=&maxResults=25&Queryl=virtual+pc+mac&Query=virtual+pc+mac&QuerySource=gsfxSearch_)  
([http://support.microsoft.com/search/default.aspx?InCC\\_hdn=True&Catalog=LCID%3D1033%26CDID%3DEN-US-KB%26PRODLISTSRC%3DON&Product=&KeywordType=ALL&Titles=false&numDays=&maxResults=25&Queryl=virtual+pc+mac&Query=virtual+pc+mac&QuerySource=gsfxSearch\\_](http://support.microsoft.com/search/default.aspx?InCC_hdn=True&Catalog=LCID%3D1033%26CDID%3DEN-US-KB%26PRODLISTSRC%3DON&Product=&KeywordType=ALL&Titles=false&numDays=&maxResults=25&Queryl=virtual+pc+mac&Query=virtual+pc+mac&QuerySource=gsfxSearch_))
- [Additional hints and discussion about Virtual PC for Mac](http://www.macwindows.com/VPC6.html)  
(<http://www.macwindows.com/VPC6.html>)